

MEMORANDUM

DATE: January 31, 2011

TO: Policy Committee

FROM: Christy Parrish, Proffer Administrator
Kate Sipes, Senior Planner
Leanne Reidenbach, Senior Planner

SUBJECT: Cumulative Impact Modeling

I. Cumulative Impact Modeling

A. General Background and Scope

The ordinance update methodology identifies cumulative impact modeling as one of the priority areas. The goal of this topic area is to determine the feasibility of creating a system that allows accurate tracking of development as it moves from proposal to reality. This includes existing development, approved development that is not built, and estimated future build-out of vacant parcels. The third component (estimated future build-out) would likely be added a later date, but for the purposes of this memo is listed as Stage VI below. The system could then be used to assess current and future impacts on public facilities and services using fields and multipliers built into the system (e.g. school district, number of school children generated, etc.).

B. Description of Element and History

Currently, staff evaluates the impacts of proposed developments to determine the availability of infrastructure and services in the County, including school capacity, water and sewer infrastructure, and roadways. Staff has been asked to explore comments that in evaluating impacts, certain factors have not been adequately addressed to date, such as (a) impact studies have not sufficiently taken into account the impacts of existing and approved-but-not-yet-built development and (b) there may be some categories of impact which are not currently being assessed sufficiently (road capacity, watershed impacts, impacts to fire station or library capacity, etc.). As an example of the first factor, the County's current adequate public facility test policy examines the projected number of school children to be generated by a proposed development against the capacity of the school based on current year enrollment levels, but does not include an assessment of school children that would be generated by approved-but-not-yet built projects in the same school district. It is important to note with respect to the second factor that the County has a joint school and library system with the City of Williamsburg, as well as mutual assistance agreements with the City of Williamsburg and York County for a number of other facilities and services such as fire and police protection.

C. Comprehensive Plan GSAs, public input, and PC and BOS direction

During the 2009 Comprehensive Plan Update, the Steering Committee, Planning Commission, and Board of Supervisors identified the following actions related to cumulative impact modeling:

- *LU 5.1 Through the following measures, coordinate allowable densities and intensities of proposed developments with the capacities and availability of water, public roads, schools, and other facilities and services:*
- *LU 5.1.1 Reporting on the feasibility of development of a model or models to assess and track the cumulative impact of development proposals and development on existing and planned public facilities and services.*

II. Discussion Items

Staff has researched approaches to cumulative impact modeling across the country and received information from consultants in the field through a Request for Information (RFI) process. The RFI that was submitted includes a more technical description of the cumulative impacts model and is available in attachment 1. As a result of the RFI, staff viewed a demonstration of a system with similar goals developed by a consultant for the Delaware Department of Transportation (DelDOT). The system is known as the Planning and Development Coordination Application (PDCA). Basically, this web-based system was designed to help DelDOT store, manage, integrate, and analyze development proposals and the impacts of development on surrounding road infrastructure. It enables DelDOT to input information about specific development projects, including number of new units/square footage proposed, location of new entrances to the development, impacted intersections, type of development (based on ITE land use code), trip generation information, any improvements the developer will have to install, and if money was contributed to other off-site traffic signals or road improvements. It also allows DelDOT to model the impacts of the proposed development in three different scenarios in a specified target year – undeveloped/existing, developed but without the traffic improvements completed, and developed with all traffic improvements installed. Development proposals can also be color-coded based on their status in the review process – final acceptance (when DelDOT approves the project), approved (when the locality approves the project), in progress (when it is under construction), and inactive. When the analyses are generated, the user can designate an area around the proposed project to encompass other projects that are either under review or approved in order to incorporate the impacts and transportation improvements associated with those projects into the impact analysis. All of this is done visually through a GIS mapping system that allows DelDOT to archive layers based on what was built/proposed in different years. More information about this system is available on <http://www.jmttg.com/projects.html?id=0>.

As a result of this research and consultant presentation, staff has identified several stages of data collection and tracking linked with cumulative impact modeling. The feasibility of each of these stages must be assessed in order to determine the overall feasibility of cumulative impact modeling and how much staff can accomplish versus the need for additional resources or outside help. After an explanation of each stage, staff has offered an assessment on feasibility of completing the task internally and what, if any, limitations would be placed on the model as a result. The next section will discuss the pros and cons of a staff versus consultant-developed product.

A. Stage I – Residential Development Tracking

Staff identified residential development tracking as the first stage to developing a cumulative impact model. This stage includes assessing the following:

- residential development currently on the ground and occupied;
- residential development approved through a master plan, site plan, or subdivision plat but not built yet; and
- a way to simply track each residential unit from plan approval to construction and occupancy.

Residential development was identified as the first stage because residential units typically have greater direct impacts on County facilities without the same high generation of tax revenue as commercial developments. Additionally, information necessary to track individual single-family units is more readily available in real estate data and certificate of occupancy tracking. Tracking apartments, mobile home parks, and nursing homes requires slightly more research as each is generally only assigned one tax map number but includes multiple units. Staff has developed an Excel table to assemble this data and is working through assembling and tracking residential development for the Jamestown District as a trial (see attachment 2). This first stage would not involve assessing or evaluating the impacts that various development projects have had on public infrastructure/facilities, but would be geared toward assembling an accurate inventory of residential development and a way to track a development proposal through its lifecycle.

Staff has determined that this stage of the project could be done internally. Regardless of whether or not subsequent phases are completed in-house or by using a consultant, data collection and verification would need to be done by Planning staff before moving forward. So far, this has involved learning about each of the different computer systems operated by various County divisions (i.e. Code Compliance uses HMS, Planning uses CaseTrak, Real Estate uses EGTS and ProVal, etc.) and understanding what data is already being collected in those systems and how it can be pulled into a single source. This has also involved identifying gaps in information that we need to collect to help streamline the tracking process. The limitation associated with this stage is that the update process will not be totally automated and will require time to make sure new data is incorporated and accurate. As a result, updated data would be available on a semi-annual basis rather than on-demand. Additionally, the data would primarily be in spreadsheet form rather than a visual representation of the development through GIS mapping.

This stage of the analysis is similar to the type of data generated by the James City County Citizen's Coalition (J4C) from 2007-2010. Through creating a tracking database, staff can verify the J4C data, including reconciling Planning data with Real Estate Assessment data, and establish consistent and standard operating procedures for keeping this data updated. Additionally, staff's figures will include residential units approved on already subdivided parcels (known as "acreage lots") and not included in a formally named subdivision and can also exclude common areas or dedicated open spaces within residential neighborhoods, which was not consistently done through the J4C numbers.

B. Stage II – Residential Assessment of Key Impacts

The second stage of developing a cumulative impact model is adding in an assessment of how existing and proposed/in-the-pipeline (also known as "approved-but-not-yet-built") residential developments impact certain selected infrastructure and public facilities. Staff has identified water, sewer, and school impacts as the most straightforward items to address initially because the County and JCSA already have established methodologies and historical data that identify water and sewer usage and the number of school children generated by various types of residential units.

Staff has determined that this stage of the project could also be done internally, but would be subject to the same limitations associated with Stage I listed above. As an alternative, staff could turn over the information collected in Stage I to an outside consultant to develop an impact tracking system. This would likely be strongly linked to GIS mapping so it could be visually displayed and manipulated. The data may also be able to be updated more frequently.

C. Stage III – Commercial Development Tracking

The third stage in cumulative impact modeling involves tracking commercial development. This stage includes the following:

- categorizing buildings by type of non-residential use (industrial, retail, office, etc.);
- assessing what commercial development is currently on the ground and occupied and what commercial development has been approved through a master plan or site plan but may not have been built yet; and
- developing a way to simply track commercial square footage from plan approval to construction and occupancy.

Staff has not begun to work on this stage of the process yet, but anticipates that it will resemble the process and limitations of Stage I above. Staff also anticipates that some work on collecting and verifying information will have to be done internally regardless of whether a consultant is used to actually develop the impact model.

Commercial development presents some unique challenges not present with residential development tracking. First, real estate data does not differentiate commercial buildings by type. Each commercial property is coded as “commercial and industrial.” Staff will need to examine this data to verify what actually exists in terms of commercial uses. This will involve re-coding each structure in the Real Estate Assessments database. Second, non-residential buildings can frequently change uses, often changing between categories for example, from office to retail. Site plans are not always required for use changes and building permits do not always clearly state the use change. Staff would need to develop a way to track these changes to update the model.

D. Stage IV – Water and sewer impacts of existing and proposed/pipeline commercial projects

The fourth stage involves adding in an assessment of how existing and proposed/in-the-pipeline commercial developments impact certain selected infrastructure. Staff has identified water and sewer infrastructure as the priority to determine impacts. Once each commercial building use is re-coded in Stage III, staff will be able to evaluate how different uses place different demands on infrastructure. Staff will then need to work closely with JCSA to identify standard water and sewer usage figures for each of the commercial use categories, similar to what is already available for residential units. This can again be accomplished in-house, but has been identified as Stage IV due to the tracking and inventorying challenges indicated above.

E. Stage V – Additional tracking and impacts

As Stage V, additional tracking and impacts for various other facilities could be added. Based on initial feedback during the Comprehensive Plan update and current planning case reviews, staff has identified the following facilities and infrastructure to add to the impact tracking in phases once Stages I-IV are completed and reliable:

- Environmental
- Traffic and transportation
- Fire/EMS
- Police
- Library
- Parks and Recreation

Staff has only briefly researched the efforts that would be involved in assessing the impacts of development for each of these categories to determine that there is not data readily available to easily track those impacts. Many of the above, particularly the public facilities, have per capita standards outlined in the Comprehensive Plan. By tracking the cumulative impact of development in these areas, figures could be compared to the guidelines in the Comprehensive Plan to evaluate available capacities. To help prioritize which of these areas should be targeted for further research, staff is seeking guidance on what questions the Committee anticipates will be asked of the cumulative impact model (beyond school and water and sewer impacts) in the near future.

F. Stage VI – By-right development potential

The final stage of the cumulative impact model would involve looking at the by-right development potential of land in the County to determine what could be constructed absent any additional approvals from the Planning Commission or Board of Supervisors. The County has looked at by-right development potential on two occasions in the last 10 years, each with different constraints and objectives. The first time that a development potential analysis was conducted was prior to the 2003 Comprehensive Plan update. In this model, a consultant (Kimley-Horn) looked specifically at each undeveloped parcel within the Primary Service Area (PSA) designated for residential development by the Comprehensive Plan and the estimated a unit yield. Land Use designations and regulations about development and environmental protections have changed since this point, which would likely change the lot yield estimated by the analysis. This analysis also excluded areas outside the PSA and commercial development potential.

The second analysis was conducted by a consultant (URS) during the 2009 Comprehensive Plan update. URS evaluated areas both inside and outside the PSA and looked at commercial and residential development by Transportation Analysis Zone (TAZ). Another primary difference between the 2003 Kimley-Horn and 2009 URS analyses is that instead of analyzing each parcel individually, URS aggregated undeveloped parcels, applied a generalized density or intensity of uses, and then applied a generalized discount factor to account for environmental constraints and roadways. This could be a good start to the development potential analysis for the cumulative impact modeling of transportation impacts because the TAZ is a good way of organizing this data. It may, however, be more difficult to disaggregate and reorganize the data to use by school district or voting district since each has different boundaries.

The development potential is strongly influenced by current zoning ordinance regulations and Comprehensive Plan Land Use designations. As such, the estimate of units can vary at different points in time under different scenarios. One of the reasons why this task was left for the last stage is so that staff can account for any changes in permitted densities that result from the ordinance update process. This task could be accomplished internally, but could involve a significant work effort. Staff will need to further evaluate this after completion of the previous stages to determine whether the analysis completed by URS can be used as a starting point for updating the development potential figures.

III. Summary of Pros/Cons

The information discussed above helps frame a discussion of the overall feasibility of a cumulative impact model. In short, it is feasible for staff to develop a basic system for tracking the cumulative impacts of commercial and residential development on schools, water, and sewer infrastructure.

Additional impact modeling, as outlined in Stage V above, would require some additional research. The feasibility of Stage VI, the by-right development potential, is not expressly included in this summary.

The kinds of questions that the model needs to be able to answer, how frequently the data needs to be updated to answer those questions, and what format data needs to be compiled in all lead into the decision of how to proceed with evaluating the cumulative impacts model. Below is an outline of the pros and cons of producing the model internally versus using a consultant. While reading, keep in mind that data collection and verification still has to be completed by Planning staff in either scenario. These pros and cons are geared toward facilitating a discussion about the Committee's expectations for the model, which will help staff, County Administration, and the Board of Supervisors determine whether the model will be developed internally or using a consultant.

Staff-based cumulative impacts model:

Pros	Cons
- Lower cost to develop and implement	- Requires more staff time up-front and to maintain
- Uses existing data (for the impact categories in Stage II, other categories require more research)	- Data will be updated semi-annually so there will be a lag between when a unit is occupied and when it appears as occupied in the model
	- Limited reporting capabilities

Consultant-based cumulative impacts model:

Pros	Cons
- Designed to fit County's needs	- Cost – based on a request for information completed in the fall, it would cost \$100-\$150K for consultant fees and an estimated \$15K for software/technology upgrades
- More comprehensive analysis tools, including running projections for future years	- Additional software/system for Information Technology to maintain (though consultants indicated this should be minimal)
- Real time updates and reporting capability	- Greater amount of initial staff time from other departments/divisions
- Once the system is operational, less staff time will be required for system maintenance	
- Once operational, system can be maintained by County staff (i.e., no additional cost to consultant to maintain)	
- Allows geographical-based reporting (maps)	
- Uses existing data (for the impact categories in Stage II, other categories require more research)	
- Consultants would be more experienced and knowledgeable so impact models could	

be more sophisticated	
- System could be compatible with CaseTrak	

The broad trade-off between a consultant-developed model and a staff-developed model is between timing and cost. In a consultant-designed process, Stages I-IV as described above could be carried out in a more condensed timeline. For example, staff could be assembling and validating information about existing commercial development while the consultant is developing the residential impact model. Additionally, they would be better equipped to more quickly delve into the broader impacts denoted in Stage V. While the model could be operational in a shorter timeframe, there is a larger cost associated with securing a consultant. In a staff-led process, cost is kept to a minimum and would only require purchase of hard/software over the top of staff's salary and time, but the model would be serially assembled in the stages outlined above. Another trade-off is in the scale and features of the model. As discussed earlier, staff can develop a basic model to track cumulative impacts. However, a consultant would be able to provide a model with additional graphical and tracking features, conveniences, more up-to-date data, and a more intuitive interface.

IV. Staff recommendation

This memorandum serves as an update on the feasibility of developing a cumulative impact model. Since this task does not have an associated ordinance section or language, the Policy Committee does not need to vote on specifics at this time. Instead, staff is requesting the Committee's feedback on expectations for the cumulative impacts system and guidance on the following questions:

- What questions should the model be able to answer (related to various impact categories)?
- How frequently do updated reports need to be generated?
- What format do reports and data need to be in for easy use – spreadsheet or graphic?

Through answering these questions, staff can determine if internal development of a system meeting these expectations can be developed. Otherwise, staff can anticipate requesting additional funds in the budget to secure a consultant to help develop the model.

V. Conclusion

Based on the feedback and available funding, staff will determine the most appropriate direction for the project. For the time being, staff is proceeding to develop the database and collect and verify data internally and will continue to keep the Committee updated on progress. Feedback will also be used to help in the present budget planning process if there are critical system features identified that can best be obtained through use of a consultant.

Attachments:

1. Request for Information
2. Staff progress on residential development tracking – Jamestown District